See Proposed Contruction Update

Department of Environmental Protection

Jeb Bush
Governor

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

David B. Struhs
Secretary

St. Johns River Water Management District (SJRWMD)
C/o Lance D. Hart
SJRWMD
4049 Reid Street
Palatka, Florida 32178

File No.: 05-133404-001
Modification File No.: 05-133404-002
Brevard

Dear Mr. Hart:

Your request on November 26, 2002 to modify the your Noticed General Permit has been received and reviewed by Department staff. The modification includes a 5 year extension to the original expiration date of December 23, 2002. The expiration date of permit file number: 05-133404-001 is hereby modified to December 23, 2007.

The above change is not expected to adversely affect water quality and will not be contrary to the public interest. Since the proposed modification is not expected to result in any adverse environmental impact or water quality degradation, the permit is hereby modified as requested. By copy of this letter and the attached drawing, we are notifying all necessary parties of the modification(s).

This letter of approval does not alter Specific or General Conditions, or monitoring requirements of the permit. This letter must be attached to the original permit.

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000. Petitions filed by the permittee and the parties listed below must be filed within 14 days of receipt of this letter. Petitioner shall mail a copy of the petition to the permittee at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, F.S.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the permittee's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action; or proposed action;
(d) A statement of the material facts disputed by petitioner, if any;
(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this letter. Persons whose substantial interests will be affected by any decision of the Department with regard to the permit have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This Notice constitutes final agency action unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 62-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this Notice will not be effective until further Order of the Department. Any party to this letter has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; and by filing a copy with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Notice of Permit Modification is filed with the Clerk of the Department.

Sincerely,

George Gionis
Program Administrator
Submerged Lands and Environmental
Resources Program

GG/aw/dv

Date: December 23, 2002

cc:
U. S. Army Corps of Engineers, Merritt Island (e)
Brevard County of Natural Resources (e)

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to 120.52(9),
Florida Statutes, with the designated Department Clerk,
receipt of which is hereby acknowledged.

Jan Murray 12-23-02
Clerk Date

CERTIFICATE OF SERVICE

The undersigned certifies that this Modification, including all copies were mailed before the close of business on 12/24, 2002, to the above listed persons by

Department of Environmental Protection

Lawton Chiles
Governor

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767

Virginia B. Wetherell
Secretary

Please Respond to the:
Melbourne Office
13 East Melbourne Avenue
Melbourne, Florida 32901

NOTICE OF GENERAL PERMIT

St. Johns River Water Management District
c/o Ms. Lisa M. Grant
P. O. Box 1429
Palatka, Florida 32178-1429

File No.: 05-133404-001
Applicant: St. Johns River Water Management District

Dear Ms. Grant:

This is to acknowledge receipt of your notice on December 5, 1997, of intent to use a noticed general permit to finish those projects associated with the previously permitted Upper St. Johns River Basin Project, pursuant to Rule 62-341.485, F.A.C.

Based on the forms, drawings (attached), and documents submitted with your notice, it appears that the project meets the requirements for the noticed general permit listed above. Any activities performed under a noticed general permit are subject to general conditions required in Rule 62-341.215, F.A.C. (attached), and the specific conditions of Rule 62-341.485, F.A.C. (attached). Any deviations from these conditions may subject the permittee to enforcement action and possible penalties.

Please be advised that the construction phase of the noticed general permit must be completed within five years from the date the notice to use the noticed general permit was received by the Department. If you wish to continue this noticed general permit beyond the expiration date, you must notify the Department at least 30 days before its expiration.

In addition, your project occurs on state-owned, sovereign, submerged lands and will require authorization from the Board of Trustees of the Internal Improvement Trust Fund to use public property. As staff to the Board of Trustees, we have reviewed your project as described for the Notice General Permit (NGP), and as long as the work performed is located within the boundaries as described in the NGP and is consistent with the terms and conditions therein, we have no objection to the project. Therefore, consider this letter to also constitute the authority sought under section 253.77, Florida Statutes to pursue this project.

A copy of your notice also has been sent to the U.S. Army Corps of Engineers (USACOE) for review. The USACOE may require a separate permit. Failure to obtain this authorization prior to construction could subject you to enforcement action by that agency. For further information, you should contact the Merritt Island Office of the USACOE at 407-453-0210.

If you revise your project after submitting the initial joint application, please contact us as soon as possible. Also, if you have any questions, please contact Brian Poole at the letterhead address or call (407) 984-4800, between the hours of 8:00 a.m. and 5:00 p.m. When referring to this project, please use the file number listed above.

Sincerely,

George Gionis

George Gionis
Environmental Administrator
Submerged Lands and Environmental
Resources Program

Date: December 23, 1997

GG/bp/vq

Enclosures:
Specific Conditions for NGP 62-341.485
General Conditions 62-341.215
General Consent Conditions
Drawings

cc: U.S. Army Corps of Engineers, Merritt Island
Bonnie Wilson, DEP, Tallahassee

05-133404002

ATTACHMENT

0133404001

RECEIVED DEC - 5 1997

USJRBP
Proposed Construction

Fort Drum Marsh Conservation Area (FDMCA) - The proposed work in this area includes the completion of Levee 78 from its terminus west of Structure 252A to the western most property boundary of FDMCA. This construction also includes the installation of S-252E & F, a canal for S-252F, borrow pits, access road construction, and recreational component construction. Additionally, construction in this area includes levee breaches and canal plugs to restore the hydrology in the area and vegetation removal to enhance vegetative communities and habitat.. This work includes the restoration of the Prince/Rooney properties. Estimated Dredge Area: 5 acre, Estimated Fill Area: 32 acres

Blue Cypress Water Management Area (BCWMA) - The only proposed work in this area is the breaching of some existing levee in the area to restore the hydrology of the isolated parcels. Although not considered dredge or fill, we will make some physical blockages in canals to prevent nutrient movement (i.e., silt screens) Estimated Dredge Area: 1.2 acres.

Blue Cypress Marsh Conservation Area (BCMCA) - After the construction of S252 floway, the only proposed work in this area is the breaching of some existing levee in the area to restore the hydrology of the isolated parcels and the construction of berms to direct flows. This work includes work in Kenansville Lake, and the Gun Club property. Estimated Dredge Area: 2.8 acres, Estimated Fill Area: 4.5 acres

St. Johns Water Management Area (SJWMA) - After the completion of the work that is currently underway, no additional dredge or fill work is proposed for this area.

St. Johns Marsh Conservation Area (SJMCA) - The proposed work in this area includes the installation of canal plugs, modifications to canal plugs, restoration of the Sixmile Creek Restoration Area, and the restoration of the Deseret Addition. Restoration includes pump operation for a five year period to establish desirable wetland vegetation, levee breaches and canal plugs to restore the hydrology. Additionally, downstream improvements will be made at S-250A, C & D. Also, as part of the project, Lakes Hell n Blazes and Sawgrass will be dredged 2 to 3 feet as part of the Flordia Freshwater Fish and Game Commission muck removal project. The material will be disposed in Sawgrass Lakes Water Management Area Estimated Dredge Area: 608.28 acres, Estimated Fill Area: 7.0 acres

Three Forks Marsh Conservation Area (TFMCA) - The proposed construction in this area includes installing S-257, levee construction, diversion of the flows from S-96B into this area, canal construction, operation of pump stations for the restoration of the Mary A, Sartori East, Broadmoor Restoration properties, and levee breaches to connect Mary A and Sartori East. The restoration of the Broadmoor project will include some internal modifications to include muck applications, canal plugs, levee breaches, modifications to

S-255 and S256, and pump operation. Additionally, wildlife habitat island will be constructed throughout TFMCA. Estimated Dredge Area: 39.10 acres, Estimated Fill Area: 34.10 acres

C-1 Rediversion Project - The proposed work the C-1 Rediversion Project area includes construction of Levee 74N, Three Forks Western Levee, C-1 Retention Area North and South levees, S-261, S262, Intermediate Water Control Structure, and emergency outlet, pump stations, excavation of C-1 Retention Area, and internal modifications to the Sawgrass Lakes Water Management Area and C-1 Detention Area. Estimated Dredge Area: 1,287.42 acres, Estimated Fill Volume: 610.6 acres

Const. of Levee (New
2 culvert Structures
Replace pipes
No Dredging
Repair of the culvert [illegible]
Borrow Pit Area contained

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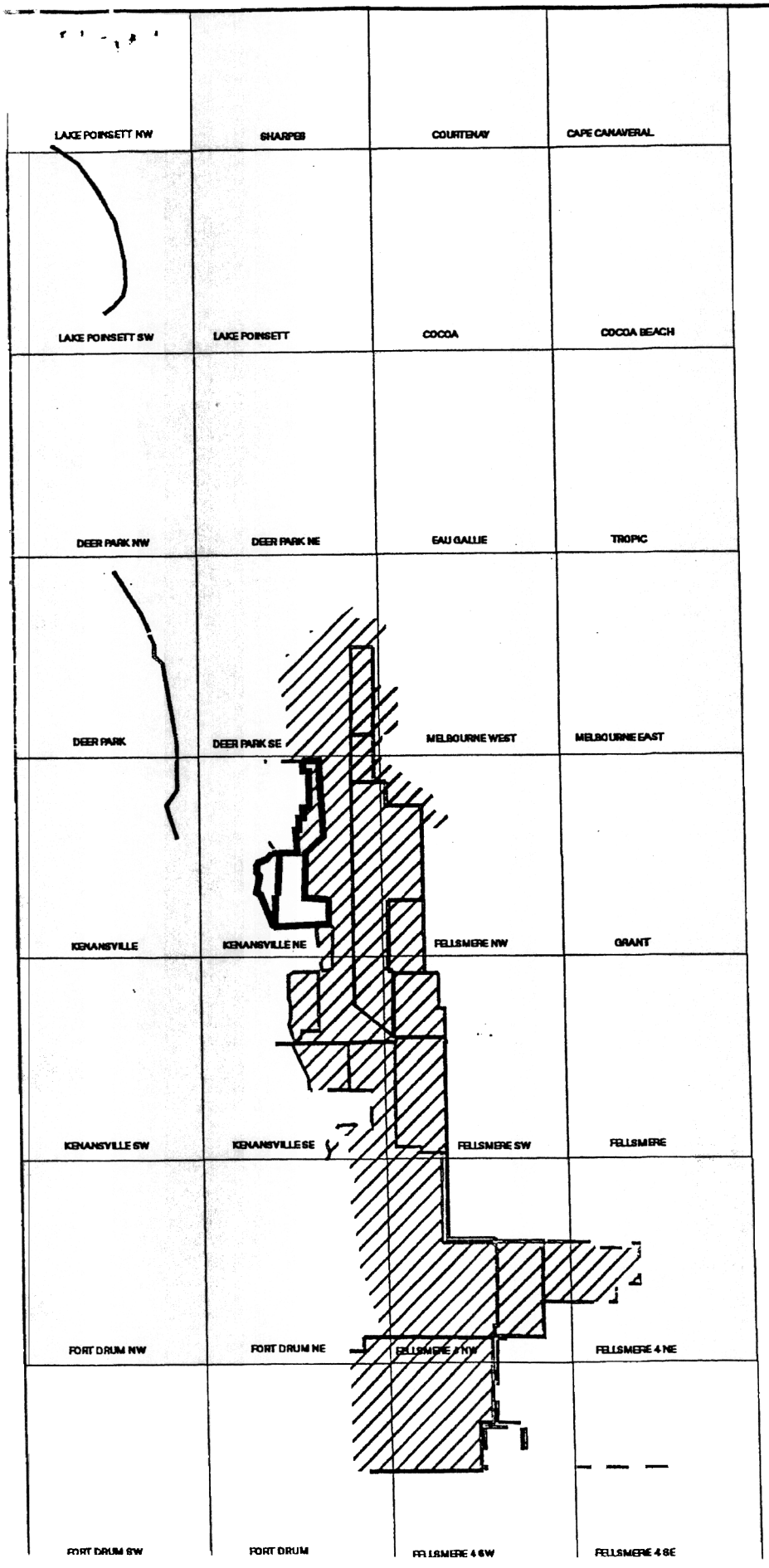
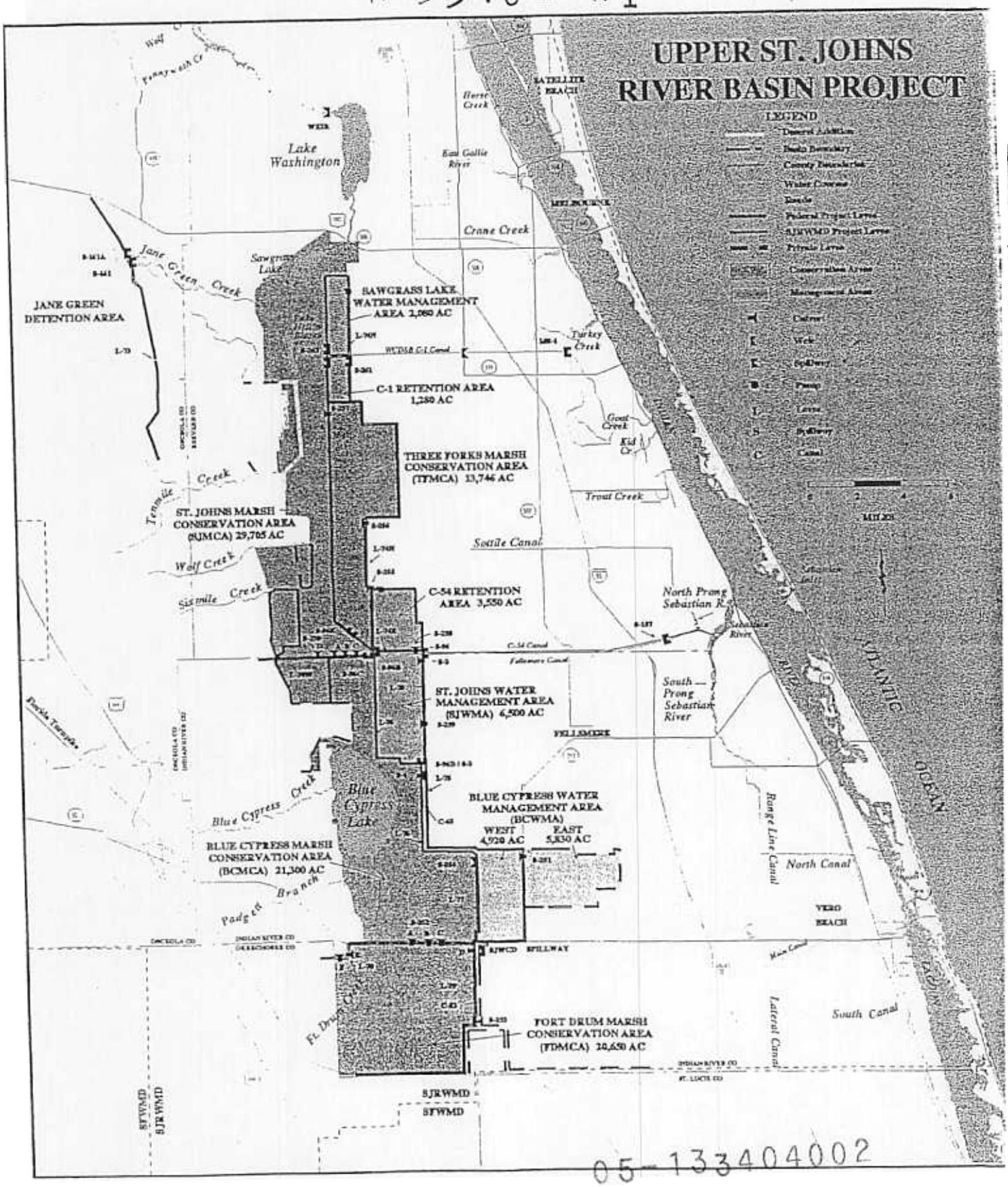
01334040001



Upper St. Johns River Basin Project
On USGS Quad Grid

ATTACHMENT 2.



Upper St. Johns River Basin
Wetland Reserve Program
Broadmoor Marsh Restoration Project

Introduction

The Broadmoor Marsh Restoration Project (acquired as Willowbrook Farms), located in Brevard County, is a 8-year project to restore and maintain 2,800 acres of farmed and prior converted wetland (Figure 1). The restoration of acreage currently in row crops to a mosaic of wetland communities will provide habitat for a wide variety of migratory birds and other wetland dependent species. The incorporation of Broadmoor marsh into the St. Johns River system will ultimately improve water quality, both on-site and downstream. Additional flood storage will be provided and it is expected to decrease the magnitude and frequency of freshwater discharges through C-54 to the Indian River Lagoon.

Preliminary Restoration Design

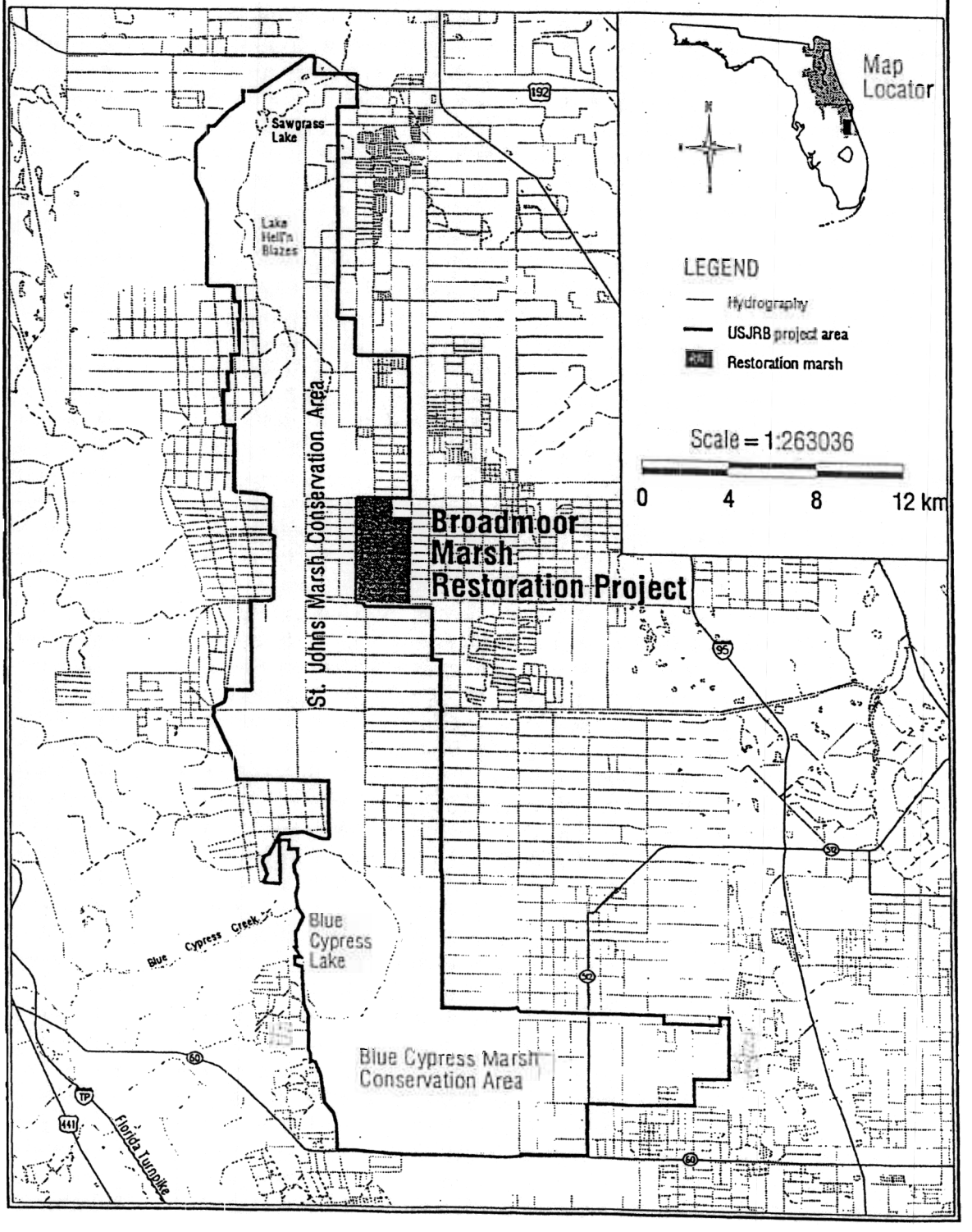
A three-phased approach to restoration will be employed.

Phase I. Site Preparation
Phase I will involve the installation of a pump, repair of external levees and construction of the necessary water control structures to enable hydrologic manipulation. An initial treatment of exotic aquatic weeds, such as water lettuce, in existing drainage canals will be conducted. In the event that wetland seed sources are absent or minimal on the property, portions may be planted with wetland vegetation to encourage the establishment of a diverse plant community. Chemical soil amendments may be administered to aid the reduction of phosphorus in the nutrient-rich water of newly flooded fields. The completion of this phase is scheduled for June, 1999.

Phase II. Shallow Flooding
Phase II will involve the maintenance of shallow water levels through pumping and operation of water control structures. This will provide conditions appropriate for the establishment of wetland vegetation either from a remnant seed bank, if present, or to maximize survival of planted vegetation. During this phase, water chemistry is expected to improve, particularly by decreasing phosphorus levels, due to sedimentation and uptake by growing wetland plants. The duration of this phase is expected to be 3 years.

Phase III. Institution of Natural Hydrologic Regime
The third phase is the institution of a natural hydrologic regime that will support and maintain the wetland community long-term. Once wetland vegetation has

Figure 1. Location of Broadmoor Marsh Restoration Project



Site Topography and Internal Drainage - The surface elevations for the site range from 17 to 25 ft. NGVD (Figure 2). There are over 70 miles of ditches within the property that range in depth from approximately 1 foot to 10 feet below surface elevations. A pump station on the southeast levee was previously operated to provide external drainage into the BCMCA. The property has subsided 4-5 ft. on average, with a maximum of 7 ft. of subsidence on the eastern boundary. This has created a relatively steep east-west elevation gradient (Figure 2). Approximately 50 percent of the property lies below 19 ft. NGVD, and 85 percent of the area is below 22 ft. NGVD (Figure 3). Adjacent marsh elevations in the BCMCA are generally between 23 and 24 ft. NGVD.

Water Quality - Water quality data are available for the S.N. Knight property from 1987. Between 1987 and 1991, water quality samples were collected by the owner for compliance reasons. Samples indicate that Class I standards were met for all pesticides analyzed. The average total Kjeldahl nitrogen (TKN) value was 1.02 mg/l with a range of 0.39 to 2.30 (N=7). The average total phosphorus (TP) value was 0.30 mg/l with a range of 0.12 to 0.76 (N=7). Water quality samples have been collected monthly on the S.N. Knight property by the District since September 1993. Data from September 1993 to January 1994 indicate that average TKN levels have increased four-fold to 3.97 mg/l and average TP levels have increased nearly an order of magnitude to 2.51 mg/l (N=5).

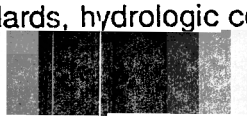
Historic Vegetation - Based upon 1943 aerial photography and soil associations, about 75% of the S.N. Knight property was shallow marsh. Natural vegetation was typically maidencane (*Panicum hemitomon*), sawgrass (*Cladium jamaicense*), cattails (*Typha spp.*), buttonbush (*Cephalanthus occidentalis*), pickerelweed (*Pontedaria spp.*) and arrowheads (*Sagittaria spp.*). The remainder was wet prairie and scattered areas of hydric hammock occurring on slightly higher elevations on the western portion of the property.

2.0 Restoration Design

Specific restoration and management objectives for the S.N. Knight property are to establish a deep water habitat and ultimately to hydrologically reconnect the site to the adjacent BCMCA. Restoration will be accomplished in two phases which are described as follows.

Phase I Restoration - duration: 2 - 5 years

The objective of Phase I is to isolate S.N. Knight in order to minimize the adverse impacts of poor water quality on the BCMCA. Agricultural properties that are reflooded have a significant surge of nutrients that are released from the soils and become resident in the water column. If water is discharged from this property into State Class I waters (BCMCA), we would expect to violate State water quality standards. However, isolating the property for a certain period of time will allow excess nutrients to become bound to the soil matrix and incorporated into plant tissues. When water quality samples indicate that the water in the S.N. Knight property meets State water quality standards, hydrologic connection with BCMCA will be instituted.



Flood control concerns have been considered in addition to water quality issues. In order to provide flood control, an earthen weir at an elevation of 24.5 ft. NGVD will be constructed in the east levee connecting S.N. Knight to the BCMCA. According to hydrologic models, this weir would provide the necessary flood control and water exchange from S.N. Knight to BCMCA would occur for 1 day in 11 out of 47 years; for 7 days in 9 out of 47 years; for 14 days in 6 out of 47 years; and for 30 days in 3 out of 47 years. There will also be additional hydrologic connections constructed in the western levee to accommodate runoff from the western uplands.

Site clean-up is also part of the Phase 1 restoration. The removal of fences, culverts and other improvements, plugging of wells, removal of contaminated soil and development of recreational access will be accomplished during Phase I. These tasks will be accomplished to the greatest extent possible under flooded conditions. However, at the end of Phase I it may be necessary to pump the property down to complete the cleanup tasks that were unable to be accomplished in the flooded condition.

Phase II Restoration -

The objective of Phase II is to hydrologically reconnect S.N. Knight with BCMCA. Successful completion of Phase I is necessary before this can occur. Success will be judged primarily by meeting water quality standards. Flood control issues and fisheries management will also be considered at the terminus of Phase I.

Phase II will be accomplished by constructing a series of gaps in the eastern levee of the S.N. Knight property. These connections will have sufficient bottom elevations to allow water levels within the property to fluctuate naturally with BCMCA. Based on results from Upper Basin Hydrologic Model, the long term (30 yr.) mean annual water level is predicted to be 23.45 ft. NGVD.

3.0 Restoration Work Elements

In order to facilitate interdepartmental coordination for the development of budgets and implementation of the restoration plan, the Division of Environmental Sciences has prepared the following summary of restoration work elements by departments.

A. Department of Planning and Land Acquisition

1. Coordinate for the removal of fence lines, culverts and any other structural improvements;
2. Coordinate recreational access development and appropriate signage;
3. Coordinate public use with other agencies (FGFWFC); and
4. Budget manpower and funds.

B. Department of Operations

1. Remove existing pump station;
2. Remove or mark physical improvements:
   a) 55 culverts (minimum);
   b) 20 miles of barbed-wire fences;
   c) six grain bins and one corn dryer;
   d) one 9600 ft^2 metal utility building;
3. Coordinate weir construction with Engineering;
4. Construct platforms for telemetry station;
5. Determine levee maintenance schedule;
6. Treat nuisance and exotic plant species to achieve maintenance levels;
7. Construct complete breech of eastern levee for Phase II; and
8. Budget manpower and funds.

C. Department of Resource Management

1. Plug free-flowing wells;
2. Coordinate environmental remediation; and
2. Budget manpower and funds.

D. Department of Water Resources

1. Coordinate all restoration efforts;
2. Coordinate S-250D and plug construction;
3. Design weirs in east and west levees;
4. Design recreational access;
5. Monitor water quality to determine completion of Phase I;
6. Monitor stage and design/equip telemetry station;
7. Coordinate complete breach of eastern levee for Phase II; and
8. Budget manpower and funds.

Elevation Contours

Figure 1. S.N. Knight Property, Location Map.

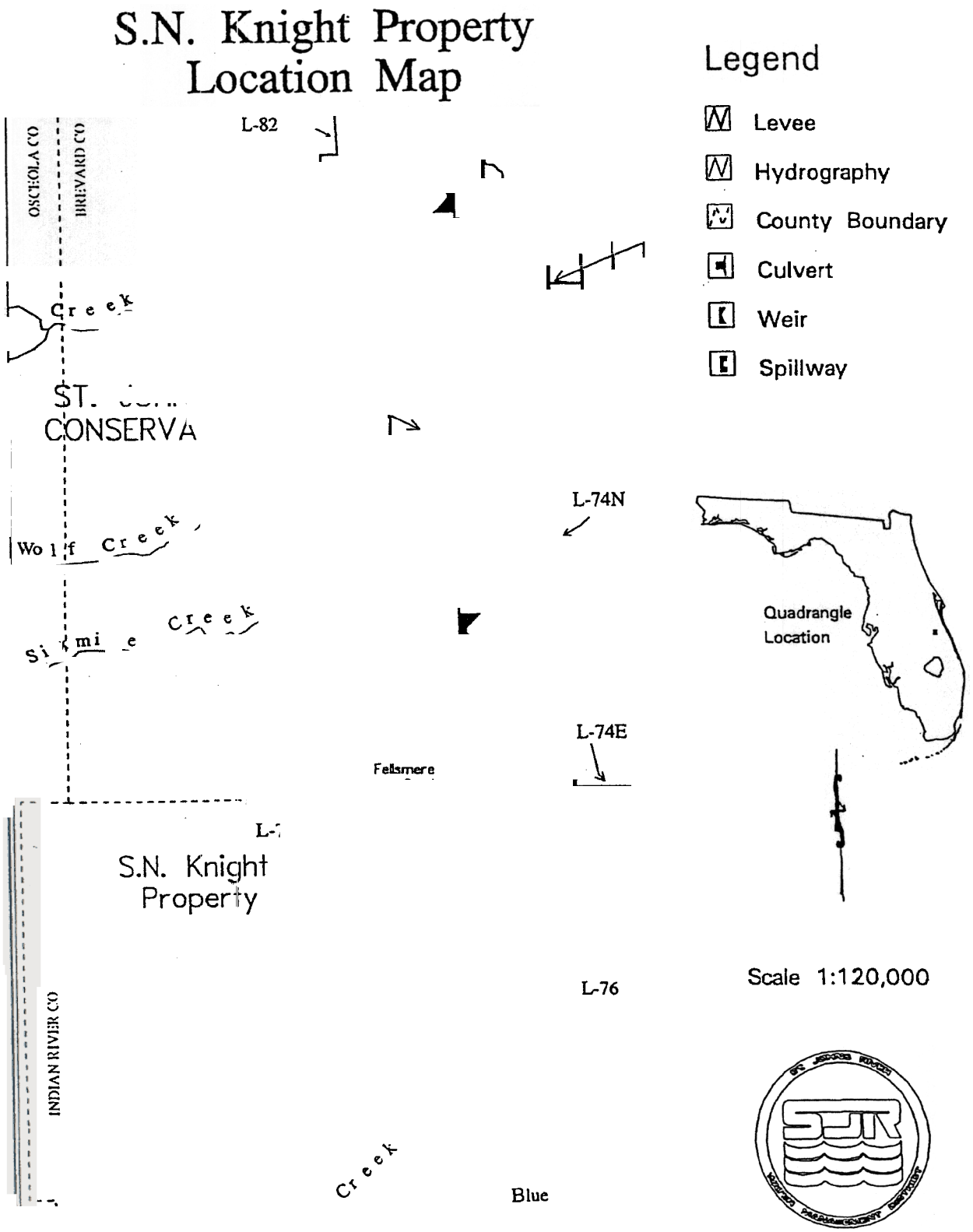
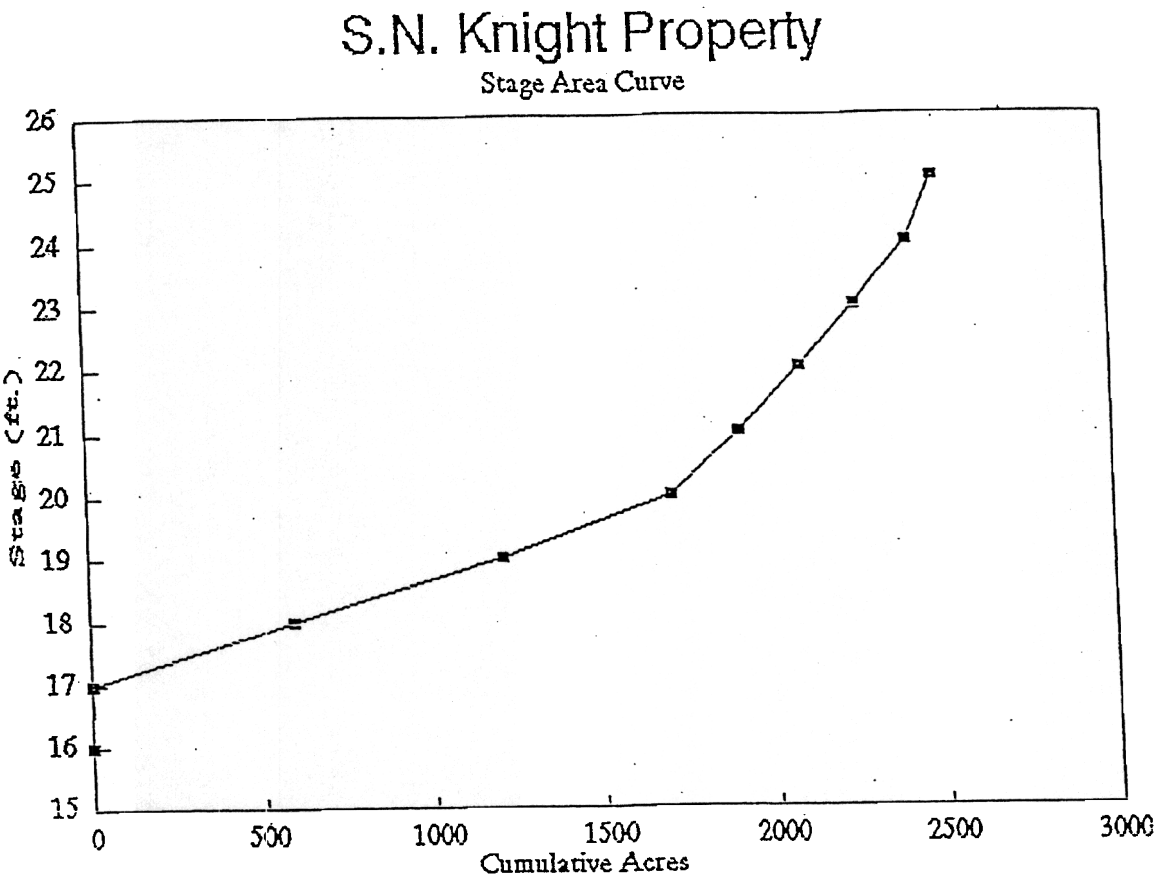


Figure 3. Stage area curve for S. N. Knight property.

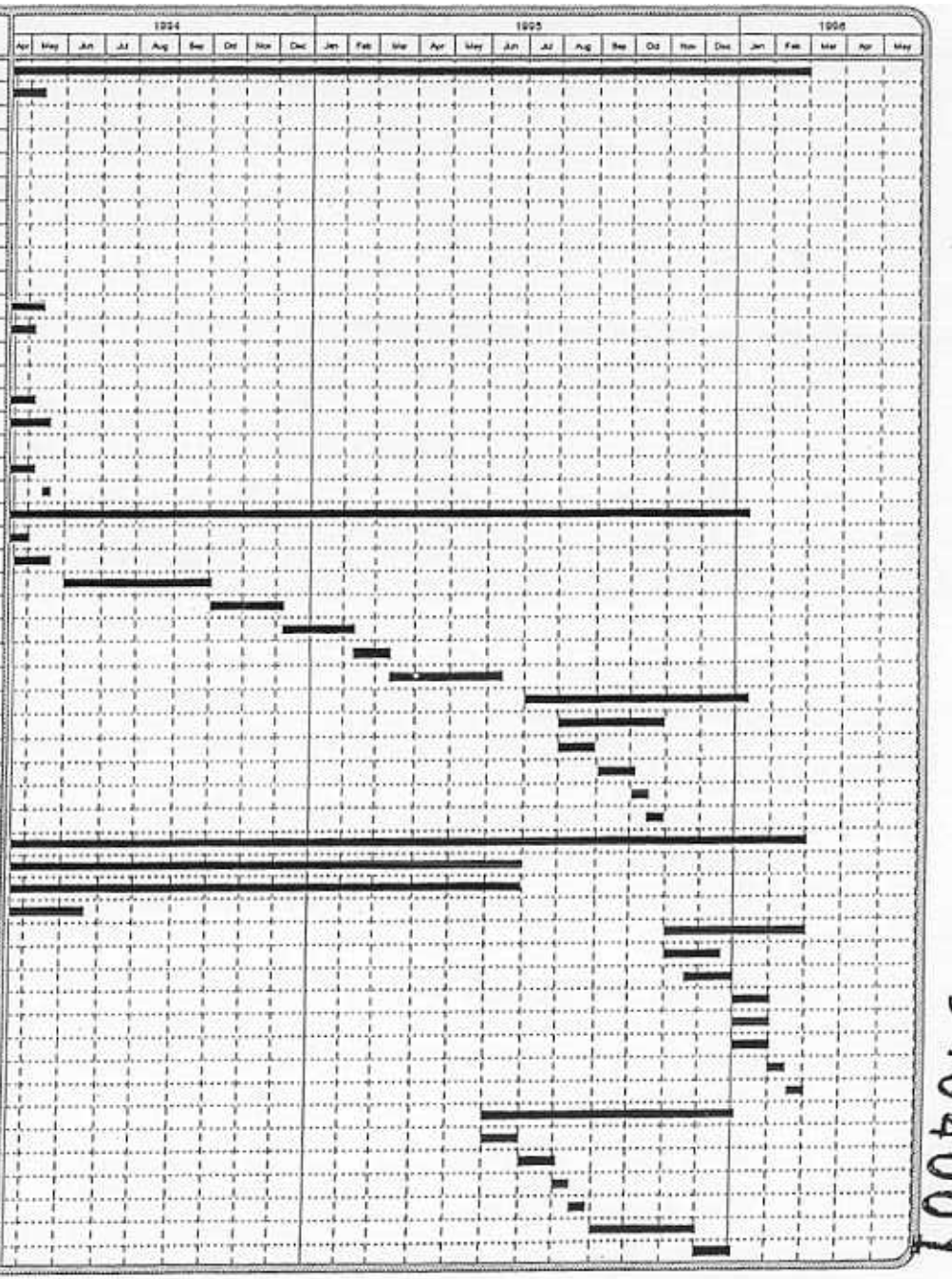


Stage-area curve for S. N. Knight.

Elevation Range	Acres	Cumulative Acres
≤ 16	0.04	0.04
16.1 - 16.5	1.7	1.7
16.6 - 17.0	1.7	3.5
17.1 - 17.5	295.4	298.9
17.6 - 18.0	295.4	594.3
18.1 - 18.5	310.4	904.7
18.6 - 19.0	310.4	1215.1
19.1 - 19.5	247.3	1462.4
19.6 - 20.0	247.3	1709.7
20.1 - 20.5	100.4	1810.1
20.6 - 21.0	100.4	1910.5
21.1 - 21.5	91.6	2002.1
21.6 - 22.0	91.6	2093.7
22.1 - 22.5	85.0	2178.7
22.6 - 23.0	85.0	2263.7
23.1 - 23.5	80.6	2344.3
23.6 - 24.0	80.6	2424.9
24.0 - 24.5	40.0	2464.9
24.6 - 25.0	40.0	2504.9

SN Knight Schedule
Date: April 15, 1994

Task Name	Start Status	Resources
SN Knight	Started	
S-250 D Extension	Started	
Survey	Done	_Survey
Prelim Design	Done	_Design
Plans and Specs	Done	
Review/Revise - In house	Done	
Review - ACOE	Done	
Revise as per ACOE	Done	
Revise per SN Knight Res. Plan	Done	
Contracting	Done	_Contct
Construction	Started	_OPS
Remove Pump Station	Started	
Issue Work Order	Done	_OPS
Removal	Done	_OPS
Remediate Contamination	Started	_ResMan
Construct Weir/East Gap	Started	
Design Sketch	Done	_Design
Work Order Issued	Started	_OPS
Construction	Future	_OPS
Recreational Facility	Started	
Options / BC Ratios	Started	_Design
Site Decision	Future	_LandMan
Survey	Future	_Survey
Preliminary Design	Future	_Design
Detailed Design	Future	
Plans and Specifications	Future	
Contracting	Future	_Contct
Construction	Future	_OPS
Access Road	Future	
Detailed Design	Future	_Design
Design Sketch	Future	_Design
Work Order Issued	Future	_OPS
Construction	Future	_OPS
Clean Up	Future	
Phase I - Wet Conditions	Future	
Fence/Culvert Removal/Signage	Future	_OPS
Well Plugging	Future	_GroundW
Phase II - Dry Conditions	Future	
Drawdown	Future	_ES
Time for Fields to Dry	Future	
Remaining Fence Removal	Future	_OPS
Culvert Crushing	Future	_OPS
Remaining Well Plugging	Future	_GroundW
Misc. Capping/plugging/etc.	Future	_OPS
Demobilization/Clean up	Future	_OPS
Telemetry Station Design	Future	
Survey	Future	_Survey
Preliminary Design	Future	_Design
Detailed Design	Future	
Plans and Specs	Future	
Contracting	Future	_Contct
Construction	Future	_OPS



ight Schedule
ril 15, 1994

Task Name	Start / Status	Resources
	Started	
Extension	Started	
	Done	...Survey
Design	Done	...Design
nd Specs	Done	
/Revise - In house	Done	
- ACOE	Done	
es per ACOE	Done	
per SN Knight Res. Plan	Done	
tting	Done	...Contct
uction	Started	...OPS
Pump Station	Started	
York Order	Done	...OPS
al	Done	...OPS
fate Contamination	Started	...ResMan
t Well/East Gap	Started	
Sketch	Done	...Design
rder Issued	Started	...OPS
uction	Future	...OPS
onal Facility	Started	
s / BC Ratios	Started	...Design
cision	Future	...LandMan
	Future	...Survey
nary Design	Future	...Design
d Design	Future	
and Specifications	Future	
cting	Future	...Contct
uction	Future	...OPS
load	Future	
d Design	Future	...Design
Sketch	Future	...Design
rder Issued	Future	...OPS
uction	Future	...OPS
	Future	
- Wet Conditions	Future	
s/Culvert Removal/Signage	Future	...OPS
Plugging	Future	...Groundfw
- Dry Conditions	Future	
down	Future	...ES
for Fields to Dry	Future	
ining Fence Removal	Future	...OPS
rt Crushing	Future	...OPS
ining Well Plugging	Future	...Groundfw
Capping/plugging/etc.	Future	...OPS
bilization/Clean up	Future	...OPS
y Station Design	Future	
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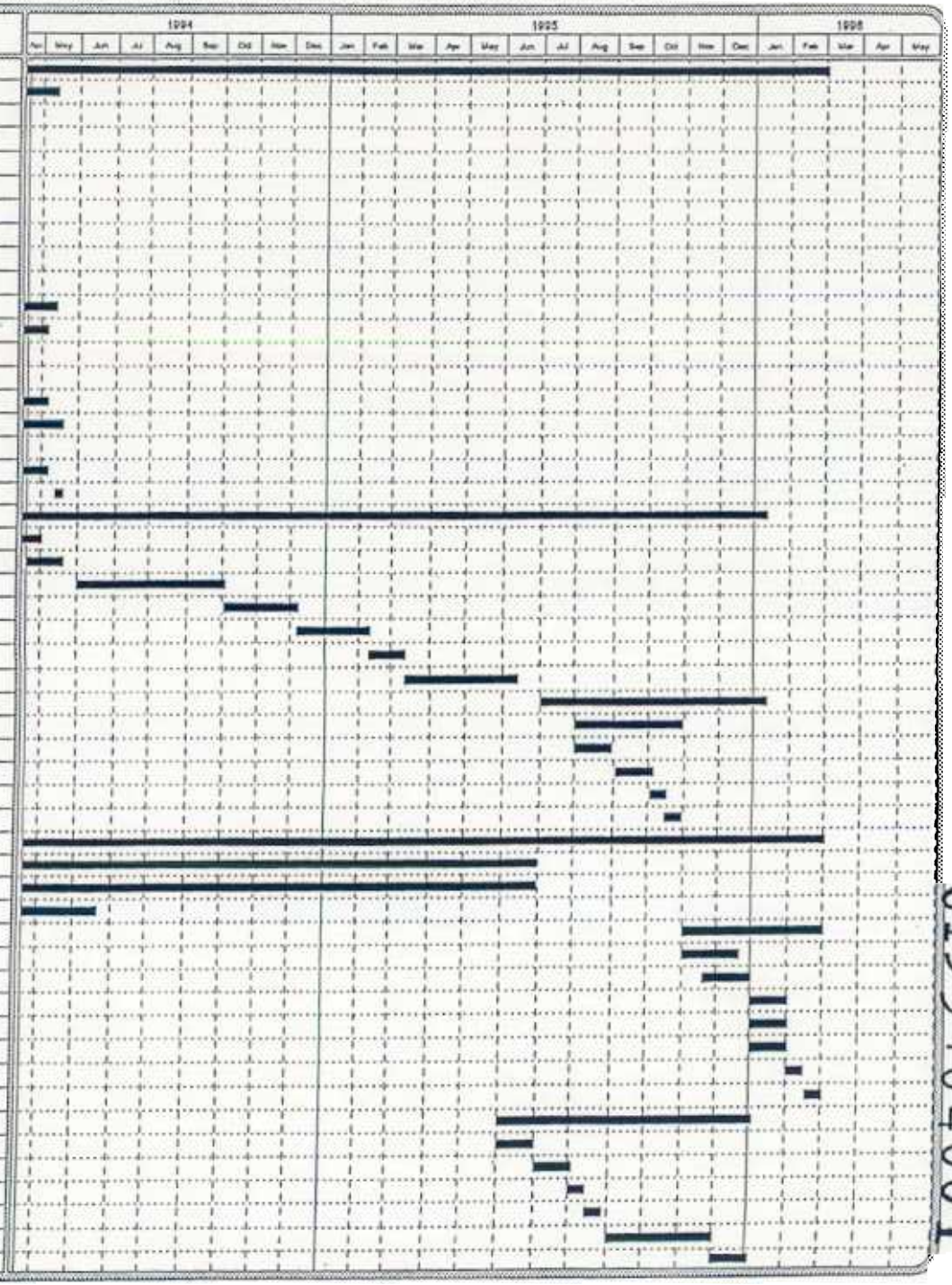

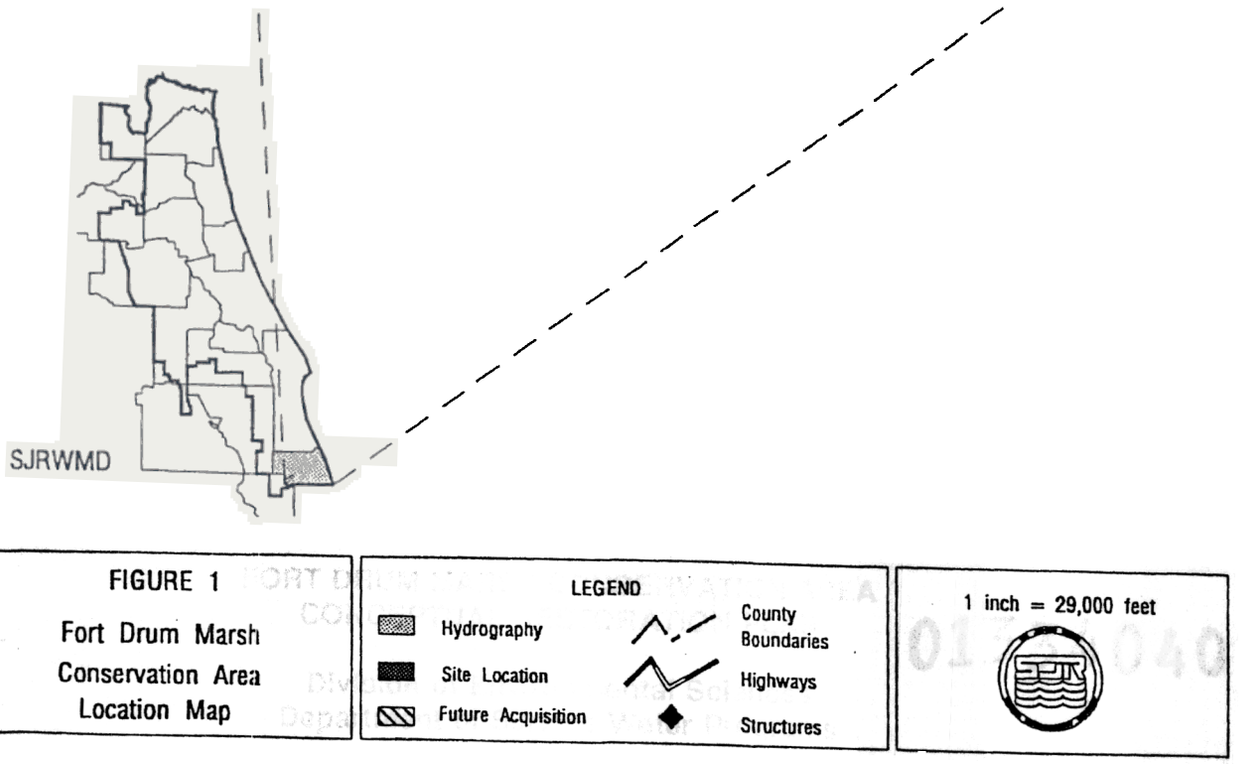

Part I. Restoration and Management

General Site Description

The Fort Drum Marsh Conservation Area (Figure 1) is a 19,670-acre component of the Upper Basin Project, a federal flood control initiative co-sponsored by the U. S. Army Corps of Engineers and the St. Johns River Water Management District. The property is located in Sections 7 through 36, Township 33 South, Range 36 East in Indian River County, Florida. Prominent natural features include the 8,000-acre Fort Drum Marsh, which is the local name of the St. Johns Marsh in this area, and almost 2500 acres of lower Fort Drum Creek which traverses the property for about four miles before discharging into the marsh. Access is from State Road 60. The land was acquired in five parcels between 1979 and 1990 for a purchase price of $18,085,421.

Restoration Goals and Objectives

The overall restoration goal of the Upper Basin Project is to protect or restore to the greatest extent practicable the biological diversity of natural communities, the productivity of ecologically important species, water quality, and aesthetic values.

Restoration objectives for the Fort Drum Marsh Conservation Area (FDMCA) are to reestablish natural vegetative communities along with their unique ecological functions and values. Restoration strategies will exploit two natural phenomena - water and fire. Field projects will focus on (1) restoring long-term hydrologic regimes within floodplain and non-floodplain wetlands; and, (2) implementing prescribed burns in areas that have historically supported fire subclimax communities.

Final plans will include restoration standards for hydrologic regimes, fire frequencies and timing, vegetative composition, and coverage. Plans will also address specific concerns related to water quality in the Fort Drum Marsh and Fort Drum Creek, and the protection of private property and public safety. Conditions will be evaluated holistically taking into consideration the stochastic nature of restored communities.

o Monitoring vegetative responses to hydrologic regimes.

o Monitoring vegetative responses to fires.

Other District offices will be involved in restoration planning and implementation. Coordination needs are listed below.

o Levee breaks. Environmental Sciences will coordinate with Engineering to break levees that traverse Fort Drum Marsh and Fort Drum Creek.

o Prescribed burns. Environmental Sciences will coordinate with Land Management to develop prescribed burn plans for upland and marsh restoration. Land Management will implement the prescribed burns as described in Part IV, and Environmental Sciences will map the burned areas and monitor vegetative responses.

o Control of exotics. When specific needs arise, Environmental Sciences will coordinate with Land Management for the control exotics; i.e., Brazilian pepper, Australian pines, coogan grass, feral hogs.

o Monitoring. For isolated wetland projects, Environmental Sciences may request the installation of monitoring wells from Ground Water, and the installation of staff gauges from Technical Data Services.

FORT DRUM MARSH CONSERVATION AREA

SCALE: 1 inch = 1 mile

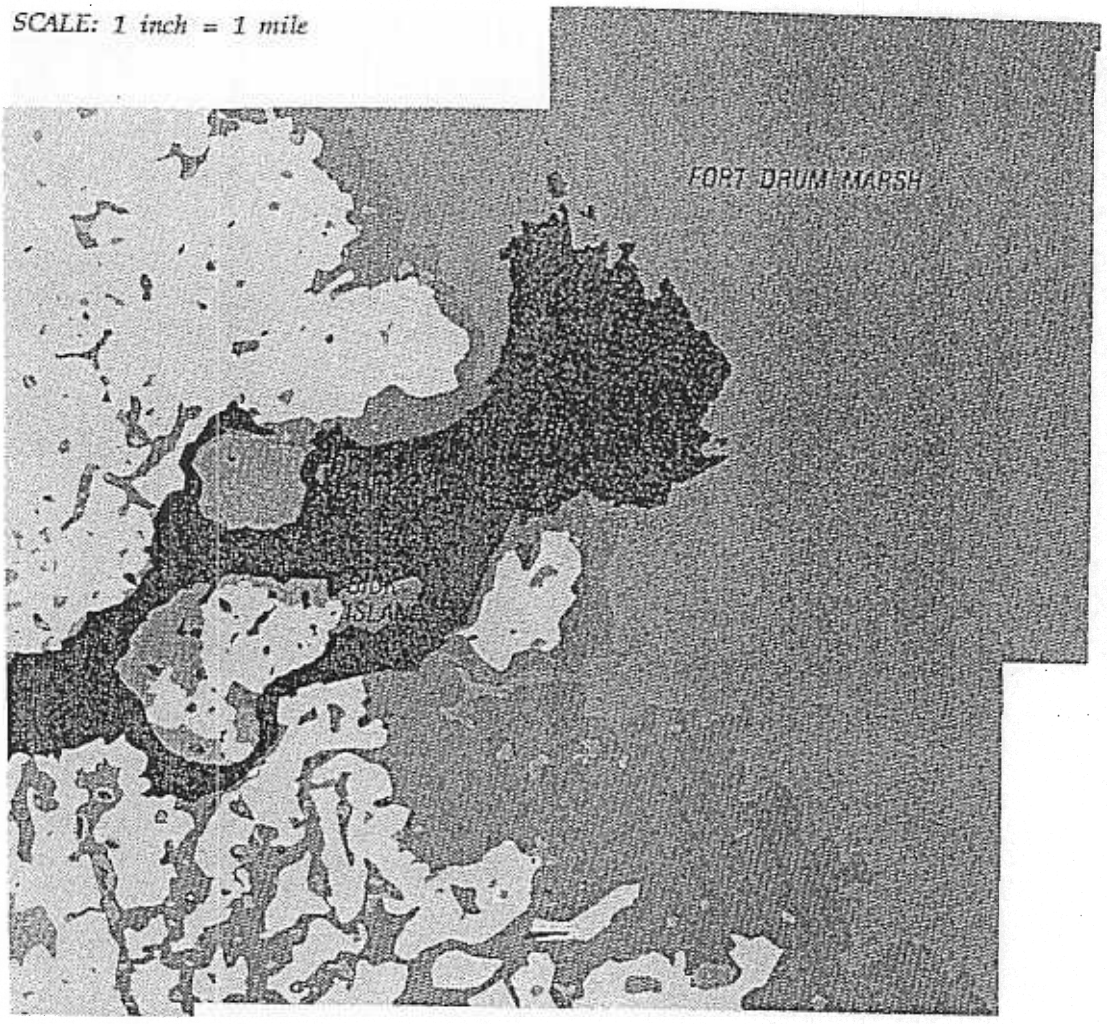

FIGURE 2

Natural Communities

(1943)

- Mesic Flatwoods
- Dry Prairie
- Prairie Hammock
- Wet Prairie
- Depression Marsh
- Hardwood Swamp
- Dome Swamp
- Floodplain Swamp
- Floodplain Marsh

Part II. Background Description

Pre-restoration Conditions

Disturbance History and Land Use. In 1943 lands within the FDMCA were used as open range, which consisted of about 8500 acres of dry and wet prairies stretching north and south of Fort Drum Creek (Figure 2). The prairies were interspersed with relatively small areas of mesic flatwoods, hammocks, depression marshes, and hardwood swamps. The floodplains of Fort Drum Marsh and Fort Drum Creek were largely undisturbed. Cow trails traversed the prairies and Fort Drum Creek, connecting Hog and Sick Islands. Site conditions were generally unchanged from the 1800s based upon an 1853 survey map of the area provided by the Department of Natural Resources.

Of particular interest for restoration planning is the extent of dry and wet prairies that were present historically. Wildfires and cattleman burns combined with grazing pressure were disturbance factors that eliminated competition by woody vegetation and contributed to the maintenance of these communities, which once covered thousands of square miles across Central and South Florida. In the last 50 years, however, these communities have been largely converted to other land uses.

Regional land use trends after the mid-1940s saw an increase in agricultural development. The FDMCA was similarly affected. Range improvements converted the prairies into pastures. Privately-built levees and adjacent borrow canals encroached within the floodplains of Fort Drum Marsh and Fort Drum Creek disrupting sheet flow patterns. By 1988, site conditions contrasted markedly to the native vegetation that existed in 1943 (Figure 3).

Recent conditions still reflect the disturbance history of the area including drainage improvements, fire suppression, and the removal of cattle after District purchase. Former prairies are now undergoing secondary succession. Some areas of wet prairies and floodplain marsh have recovered, however. Fire suppression and removal of grazing pressure have caused a marked increase in woody vegetation. Mesic flatwoods have increased in area. Flatwoods and upland mixed forests on Hog and Sick Islands have replaced the dry prairies that were once dominant there. Wax myrtle encroachment has become a problem in areas that were historically wet prairies.

Physiography. Prominent physiographic features determining natural topography and drainage for the Fort Drum Creek watershed consist of the Osceola Plain and the Talbot and Pamlico terraces, a series of marine terraces formed during the late Pleistocene. The FDMCA occurs within the Talbot and Pamlico terraces. The approximate divide between these two areas is at the 25-foot contour, which also corresponds to the annual floodplain elevation of the Fort Drum Marsh.

Topography and Drainage. Elevations range from 35 ft. NGVD to 23.3 ft. NGVD across the FDMCA. This approximate 12-foot gradient occurs in a general southwest to northeast direction, and describes the general direction of lower Fort Drum Creek as it traverses the property. The creek flows into the Fort Drum Marsh below the 25-ft. contour.

Hydrology. The Fort Drum Creek watershed and the FDMCA comprise the southernmost headwaters of the upper St. Johns River. Fort Drum Creek drains a 73 sq. mi. watershed that includes Jim Green Creek, Parker Slough, Sweetwater Branch, and Boggy Branch, which are tributaries that originate from the depression marshes and sloughs occurring on the Osceola Ridge at approximately 60 to 80 ft. NGVD. The lagtime for peak runoff to reach the Fort Drum Marsh from the upper reaches of Fort Drum Creek is relatively long. The Fort Drum Marsh receives additional runoff from 10.8 sq. mi. within the FDMCA.

Flow measurements for Fort Drum Creek are gauged off-site where the creek crosses under the Florida Turnpike. Another station is being constructed within the FDMCA in the vicinity of Hog and Sick Islands.

Water levels within the Fort Drum Marsh are impounded by Project levees L-78 and -79 and controlled by structures S-252 A, -B, and -C. Instrumentation includes staff gauges on the downstream and upstream sides of each structure. Another set of gauges are set at the southeastern perimeter of the marsh at L-79 and the C-52 flow-way.

Soils. The physical and chemical composition of soils, along with other factors such as hydrology, largely determine the types of plant communities that occur or can be expected to colonize an area. Five general soil groups occur within the FDMCA: (1) EauGallie-Myakka-Riviera; (2) Myakka-Holopaw-Pompano; (3) Riviera-Pineda-Wabasso; (4) Floridana-Delray-Holopaw; and, (5) Terra Ceia-Gator-Canova. The first two groups listed are poorly drained sandy soils associated with the uplands on the west and central portions of the property. The Riviera-Pineda-Wabasso soil group are poorly drained sandy soils associated with wet prairies formerly occurring on the south-central portion of the FDMCA. The Floridana-Delray-Holopaw soils are sands and organic soils associated with the Fort Drum Creek floodplain. The Terra Ceia-Gator-Canova group are organic soils occurring within the Fort Drum Marsh floodplain.

Water Quality. The marsh is a Class III water body as designated by the Florida Department of Environmental Regulation (Ch. 17-302.600). Project structures S-252A, -B, and -C release water from the FDMCA to the Class I waters of the Blue Cypress Marsh Conservation Area. Collection of water quality data for the FDMCA will begin after 1992.

Historic Vegetation. Figure 2 depicts nine vegetative communities that were mapped from USDA Soil Conservation Service 1943 aerial photographs (black & white, 1:52,000 scale). These communities are: (1) mesic flatwoods, (2) dry prairie, (3) prairie hammock, (4) wet prairie, (5) shallow marsh, (6) hardwood swamp, (7) dome swamp, (8)

Restoration Objectives

1. Hydrologic restoration. Restore hydrologic regimes for the Fort Drum Marsh, Fort Drum Creek, and non-floodplain wetlands.

2. Habitat improvement. Enhance wetland values for wildlife

Strategies

Two general wetland restoration and management strategies will be applied in the FDMCA - application of environmental hydrologic criteria for the Fort Drum Marsh, and restoration of hydrologic regimes. Wetland restoration projects are summarized in Table 3.

Application of Environmental Hydrologic Criteria. As S-252 A, -B, and -C are operated, the long-term hydrologic regimes of the Fort Drum Marsh will be monitored and compared to the numerical criteria stated in the District's *Environmental Water Management Plan* (Table 4). Meeting these criteria should promote the growth and propagation of vegetation endemic to the floodplain marsh, and prevent the subsidence of organic soils.

Restoration of Hydrologic Regimes. Projects will focus on restoring sheet flow and normal hydrologic regimes to those wetlands that were converted to agricultural uses. For example, specific dikes that isolate sections of the Fort Drum Marsh will

Bald Eagle (*Haliaeetus leucocephalus*)	Floodplain Marsh	Yes
Burrowing Owl (*Athene cunicularia*)	Dry Prairie	Yes
Florida Grasshopper Sparrow (*Ammodramus savannarum*)	Dry Prairie	No
Wood Stork (*Mycteria americana*)	Wet Prairie Floodplain Marsh	Yes
Florida Sandhill Crane (*Grus canadensis pratensis*)	Wet Prairie Isolated Marsh	Yes
Snail Kite (*Rostrhamus sociabilis*)	Floodplain Marsh	No

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Table 4. Environmental Hydrologic Criteria - Fort Drum Marsh.

Parameter	Criteria
Mean Depth (30-yr. avg.)	24.0 ft. NGVD
Frequency of Inundation	at least 60% at 24.0 ft. NGVD
Maximum Elevations	No more than a 1 in 10 year frequency where stage > 27.0 ft. NGVD for 14 days or more (27.3 ft. NGVD at Fort Drum Creek); 26.5 ft. for 30 days or more; 25.5 ft. for 60 days or more.
Minimum Range of Fluctuation	A 1 in 4 year frequency where stage occurs at 23.0 ft. NGVD and at 25.0 ft. NGVD for 30 consecutive days.
Timing of Fluctuation	Minimum levels occur between Apr. 1 and June 30 in > 50% of the years; maximum levels occur between Sept. 1 and Nov. 31 in > 50% of the years.
Stage Recession Rates	Should not exceed 1.2 ft. during any 30-day period, or exceed 0.5 feet during any 7-day period when stage levels are < or = 1 ft. above 26.0 ft. NGVD.

will be made to restore sheet flow across the former extent of floodplain marsh.

Floodplain Swamp The floodplain swamp community associated with Fort Drum Creek should be protected by the regulated hydrologic regimes within the Fort Drum Marsh. The environmental hydrologic criteria specifies that the depth and duration of flooding should not exceed a 14-day maximum of 27.3 ft. NGVD for Fort Drum Creek. Vegetative changes will be monitored and compared to the long-term hydrologic regime. In addition, levee breaks will be made to restore sheet flow across the creek's floodplain.

Intensity. Prescribed fires should be managed for low to moderate intensity. This can be accomplished by timing the burn to correspond to wet seasons, and by selecting appropriate weather conditions and ignition techniques.

Fire Management Units. Planned units will be added in the final restoration plans. Existing fire breaks including old dikes and levees will be used where possible to minimize disruption to natural vegetation.

Monitoring. The extent of all fires, whether planned or induced naturally or by arson will be mapped. In addition, vegetative responses will be monitored using ground surveys where possible and aerial photography. A GIS database will be developed to create the fire history of the FDMCA since the beginning of District ownership. The database will also support vegetative monitoring efforts.

Vegetative Communities and Fire Regimes

The vegetative communities endemic to the FDMCA have varying tolerances to fire. Proposed fire regimes are depicted in Figure 4 and summarized in Table 5.

Mesic Flatwoods. This is a fire subclimax community. Various fire intervals, one in eight years to five in 20 years, have been applied by other agencies. A basic frequency of *eight to ten years* is proposed for the FDMCA. This frequency can vary to promote species diversity and increase structural variation between the vegetative layers.

The Sherman's fox squirrel is a listed species that occurs within the mesic flatwoods on the FDMCA. This species should be considered when prescribed burns are planned and results are monitored.

Dry prairie. This is a fire subclimax community and should burn frequently, at least *once in four years*, to promote grass and forb production while eliminating competition from woody species.

The crested carcara, burrowing owl, and possibly the Florida grasshopper sparrow are listed species inhabit dry prairies. These species should be considered when prescribed burns are planned and results are monitored.

Prairie Hammock. This community can sustain light ground fires during the wet season when surrounding communities burn. However, intense fires may destroy these areas especially where a dense shrub layer exists that, when ignited, can transfer fire into the canopy. Crown fires can destroy hardwood species, but cabbage palms are fire-adapted. Prairie hammocks should receive *fire protection* by restricting prescribed burns in surrounding communities to the wet season when fuels are not too dry.

Part IV. Fire Management Plan

Fire History

Prescribed burns for dry prairie management were implemented by the Florida Game and Fresh Water Fish Commission in 1988. Two burn units were established on the west side of the FDMCA north and south of Fort Drum Creek. The units were 387.8 acres (157 hectares) and 728.6 acres (295 hectares), respectively. The prescription included winter burns for fuel reduction and summer burns for habitat improvement on a two-year rotation schedule. Only one burn was completed, however. The south unit was burned February 19th, 1988 and the north unit was burned on February 23rd of that year (pers. comm. Laura Richards, FGFWFC). Arson fires and cattleman burns were certainly a part of the property's fire history, but information related to these events was not readily available for this report.

Fire Management Objectives

1. Restoration. Apply prescriptions burns using appropriate fire frequencies to restore and maintain fire subclimax communities such as mesic flatwoods, dry and wet prairies, and floodplain marsh.

2. Wildfire prevention. Apply prescription fires to manage fuel accumulations that would otherwise increase the incidence of wildfires.

3. Habitat improvement. Use fire to improve or maintain habitat for wildlife.

4. Compliance. Comply with the State of Florida's forest fire laws.

Strategies

Restoration of Fire Regimes. Prescription burns will be used to restore and manage the fire subclimax communities of the FDMCA.

Ignition Methods. Two methods are possible - ground and aerial ignition. Prescribed burns initiated by ground crews will be necessary on burn plots totalling less than 300 acres. Aerial ignition using helicopter is more efficient for plots totalling more than 300 acres. An exception to aerial ignition will be made where fuel loads are heavy and additional precautions are necessary to protect local highways, transmission lines, and adjacent communities needing fire exclusion.

Timing. Wet season (Summer-early Fall) prescribed burns are preferred over dry season (Winter-Spring) burns because they mimic natural fire regimes. Wet season burns are also less intense as compared to dry season burns, and are more likely to create a mosaic effect within the managed community.